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10/743,248

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Ross Mernyk

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EXAMINER

NGUYEN, VINCENT Q

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/743,248

Applicant(s)

MERNYK ET AL.

Examiner

Vincent Q. Nguyen

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the third series inductance means coupled in series with a third conductor (e.g. claim 39) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 39, 41-43, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 39, it is not understood how is the third series inductance means coupled in series with a third conductor? What is the third series inductance means and what is meant by third conductor?

Regarding claim 41, it is not understood what is the third conductor and the coupling of the third conductor to link the magnetic flux of the third series inductances to the first series inductance. Is the second series inductance means unaffected?

Claims 42 and 43 are rejected as being dependent to the rejected claim.

For the purpose of examination, examiner assumes the system with only first and second inductance means.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 6-11, 15, 17-23, 29-32, are rejected under 35 U.S.C. 102(b) as being anticipated by Macbeth et al. (6,373,257).

Regarding claim 1, Macbeth et al. discloses a device comprising (Figure 5) a series inductance means (70, 72) adapted to be coupled in series with a conductor (7) of the network wherein a voltage is produced across the series inductance means having a waveform which relates to the derivative of current flow in the conductor (Column 2, lines 1-29); and arc detection means coupled to identify when the waveform of the voltage across the series inductance means (11, 14) is representative of arcing on the network and to generate an arc detection signal when the waveform is representative of arcing on the network (See also figures 1-1b).

Regarding claim 2, Macbeth et al. discloses at least one conductor comprises a neutral conductor (N) and a phase conductor (70, 72).

Regarding claim 6, Macbeth discloses a single conductor (N) with return current carried through a ground (True not only for prior art of Macbeth but also for every prior art of neutral conductor).

Regarding claim 7, Macbeth et al. discloses the series inductance means (70, 72) is adapted to be coupled to be in series with all current in the at least one conductor.

Regarding claim 8, Macbeth et al. discloses the series inductance means (70, 72) is adapted to be coupled in series with part of the current in the at least one conductor (Figure 5).

Regarding claim 9, Macbeth et al. discloses the series inductance means (70, 72) is an inductor.

Regarding claim 10, Macbeth et al. discloses the series inductance means (70, 72) is at least one winding of a transformer.

Regarding claim 11, Macbeth et al. discloses the transformer is coupled to a current measuring means to measure current in at least one conductor (7) of the network.

Regarding claim 15, it is inherent that Macbeth disclose the series inductance means (70, 72) comprises a conductor having a bend between 15 degrees and a turn of 360 degrees (Column 3, lines 30-31) (The inductance 70, 72 is 1000 turn. One turn is from 0 degree to 360 degree, thus, comprise the bending of 15 degree and 360 degree).

Regarding claim 17, Macbeth discloses clamping means (82) coupled in parallel with the series inductance means (70,72).

Regarding claim 18, Macbeth et al. discloses the clamping means (82) comprises at least one diode (82a).

Regarding claim 19, Macbeth et al. discloses the at least one diode comprises a first diode (82a) coupled in parallel with a second diode (82b) head-to-toe.

Regarding claim 20, Macbeth discloses the clamping means (Figure 7) comprises at least one Zener diode (10).

Regarding claim 21, Macbeth discloses at least one diode comprises first and second Zener diodes coupled in parallel head-to-toe (Figure 6a, 6b, 7).

Regarding claim 22, Macbeth et al. disclose at least one diode comprises first and second Zener diodes (10) coupled back-to-back (With respect to V1, figure 7).

Regarding claim 23, Macbeth discloses the clamping means (82) comprises an avalanche diode (82a, 82b).

Regarding claim 29-31, Macbeth discloses the inductor (70, 72) is oriented orthogonally (With respect to the entire circuit of figure 5) to the electronics circuitry.

Regarding claim 32, Macbeth et al. disclose trip means (Above the trip mechanism) coupled to the arc detection signal from the arc detection means to interrupt current flow in at least one conductor (6, 7) of the electrical power distribution network.

3. Claims 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Tiemann (6,417,671).

Regarding claim 38, and claim 39 as best understood, Tiemann discloses a device comprising a first series inductance means (50) adapted to be coupled to a first of the at least two conductors to produce a voltage across itself related to the derivative of current flow in the first conductor; a second series inductance means (52) adapted to be coupled to a second of the at least two conductors (L1, L2) to produce a voltage across itself related to the derivative of current flow in the second conductor, and an arc detection means (32, 34) responsive to the waveforms of the voltages across all of the series inductance means to determine when a waveform indicative of arcing on the network is present and to generate an arc detection signal when arcing is present.

Regarding claims 40, and claim 41-43 as best understood, Tiemann discloses a device comprising a first series inductance means (50) adapted to be coupled to a first of the at least two conductors (L1, L2) to produce a voltage across itself related to the derivative of current flow in the first conductor; a second series inductance means (52) adapted to be coupled to a second of the at least two conductors to generate magnetic flux related to the derivative of current flow in the second conductor, flux coupling means (36) to link the magnetic flux of the second series inductance to the first series inductance, and arc detection means (54, 56) responsive to the waveform of the voltage across the first series inductance means to determine when a waveform indicative of arcing on the network is present and to generate an arc detection signal when a waveform indicative of arcing is present.

Regarding claim 44, Tiemann discloses a ground fault current measuring means (30) to measure the ground fault current in at least two of the conductors of the network; and a ground fault current detection means (40) responsive to the ground fault current measuring means to generate a ground fault detection signal when a ground fault is present.

Regarding claim 45, Tiemann discloses trip means (20) responsive to the arc detection signal and the ground fault detection signal to interrupt current flow in at least one conductor of the electrical power distribution network.



***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macbeth et al. in view of Emery (4,356,443).

Regarding claims 3-5 Macbeth et al. does not disclose at least one conductor comprises a neutral conductor and two phase conductors.

Emery discloses a system similar to that of Emery and further discloses a neutral conductor (N) and three phase conductors (A, B, C) for the purpose of detecting arcing fault and protecting the multi phase system (Emery's column 1, lines 5-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the arcing to protect multi phase as taught by Emery into the system of Macbeth et al. because every electrical system with one phase or multiple phases need to be protected from arcing.

6. Claims 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macbeth et al. (6,373,257) in view of Tiemann,(6,417,671).

Regarding claims 12, 13, Macbeth et al. does not disclose the transformer forms part of a ground fault means to measure ground fault differential current flow in at least two conductors of the network.

Tiemann discloses a system similar to that of Macbeth et al. and further discloses (Figure 2) the transformer (36) forms part of a ground fault means (Circuit 30) to measure ground fault differential current flow in at least two conductors (26, 28) of the network for the purpose of detecting and protecting both arcing fault and ground fault (Column 1, lines 8-14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ground fault as taught by Tiemann into the system of Macbeth because it would have been desirable to detect and to protect both arcing fault and grounding fault.

7. Claims 14, 16, are rejected under 35 U.S.C. 103(a) as being unpatentable over Macbeth et al. (6,373,257).

Regarding claim 14, Macbeth et al. does not disclose the series inductance means has an inductance of between .1 and 1,000,000 nanohenries.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the series inductance means has an inductance of between .1 and 1,000,000 nanohenries into the system of Macbeth, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 16, the only difference between Macbeth et al. and the invention claim is that the claim recites the series inductance means comprises a conductor

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having between one and six turns while Macbeth et al.'s is 1000 turns (Column 3, lines 30-31).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate series inductance of 6 turns instead of 1000 turns into the system of Macbeth et al., since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

8. Claims 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macbeth et al. (6,373,257) (From now on refers to as Macbeth 257) in view of Macbeth (6,433,977) (From now on refers to as Macbeth 977).

Regarding claims 24, 26, Macbeth 257 does not disclose the clamping means comprising a diac.

Macbeth 977 discloses a combo AFCI/GFCI with single test button and further disclose a diac (105) (figure 2) for the purpose of triggering.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a diac (105) as taught by Macbeth 977 into Macbeth 257 for the purpose of triggering (Macbeth 977's column 4, lines 25-35).

Regarding claims 25, 27, Macbeth does not disclose a MOV, a transorb, or gas tube but it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a MOV into the system of Macbeth for the same purpose as set forth in claim 24, 26.

9. Claims 33, 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macbeth et al. (6,373,257) in view of Blades (5,432,455).

Regarding claim 33, 36, 37, Macbeth does not disclose annunciating means coupled to the arc detection means to indicate the status of the arc detection signal.

Blades discloses a system similar to that of Macbeth and further discloses annunciating means (97) coupled to the arc detection means to indicate the status of the arc detection signal.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the annunciating means coupled to the arc detection means to indicate the status of the arc detection signal as taught by Blades into the system of Macbeth et al. because it is one of the normal ways to indicate fault.

Regarding claim 35, pertinence to the discussion of claim 33, Blades discloses the annunciator means is at least one lamp (94).

10. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Macbeth et al. (6,373,257) in view of Blades, as applied to claim 33 above, and further in view of Clunn et al. (6,426,634).

Regarding claim 34, Macbeth does not disclose the annunciator means is at least one LED.

Clunn et al. discloses a system similar to that of Macbeth and Blades and further discloses annunciator is LED.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the LED as taught by Clunn into the system of Macbeth because of the same reason as set forth in claim 33.

11. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tiemann (6,417,671) in view of in view of Blades (5,432,455).

Regarding claim 46 Tiemann does not disclose annunciating means coupled to the arc detection means to indicate the status of the arc detection signal.

Blades discloses a system similar to that of Macbeth and further discloses annunciating means (97) coupled to the arc detection means to indicate the status of the arc detection signal.

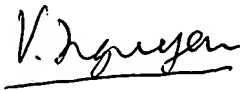
It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the annunciating means coupled to the arc detection means to indicate the status of the arc detection signal as taught by Blades into the system of Macbeth et al. because it is one of the normal ways to indicate fault.

### ***Contact Information***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent Q. Nguyen whose telephone number is (571) 272-2234. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Vincent Q. Nguyen  
Primary Examiner  
Art Unit 2858

February 19, 2005